3 DATA PROCESSING

3.1 GENERAL

Data processing was performed by Pelagos on all the data sets. In all cases navigation data were extracted from the WinFrog navigation system in DXF format for transfer to Pelagos' processing computers, which employed AutoCAD to produce the navigation base maps. Coastline images were digitized from NOAA charts and added to the charts. All data were presented in WGS84 geographical coordinates and UTM (zone 11) grid coordinates. As these coordinates were those used for the field acquisition programs, no conversions were required. Navigation tracklines were adjusted to remove the offsets of the source and receiver from the navigation antenna, thus the points plotted represented the seafloor reflection point (midpoint) for the appropriate shot. Preliminary and final charts were produce on Pelagos' in-house plotters.

3.2 VERY HIGH RESOLUTION SHALLOW PENETRATION DATA

The same Delph2 system used to acquire the data provided the processing functions required. An example line was replayed using a variety of filter, gain and display options to find the most advantageous. Sample records of the better section were provided to the DMG and USGS personnel for approval, at which point a full set of data were replayed to produce a set that was consistent from line to line. As with the acquisition phase, data were plotted on the Atlantek thermal plotter to produce the final sections. In addition, certain lines were replayed at different scales and gain settings to provide the uninterpreted sections used for the DMG report.

3.3 HIGH RESOLUTION MULTICHANNEL DATA

Medium penetration data were processed using a ProMAX system consisting of an IBM computer, OYO plotter and Advance Geophysical software. The first processing step was to associate the seismic data with the relative positions for the source and receivers by means of a geometry application. Next the true amplitude of the traces was recovered, and a preliminary (brut) stack of the data was run to insure that the geometry was being applied correctly. At this point any geometry errors were removed and the data passed into the main processing sequence.

The preliminary steps of the main processing steps were concerned with balancing the amplitude of the traces, both in time and space and removing any system artifacts. The steps used to accomplish this were:

a. F-K filtering
b. Spiking deconvolution
c. spectral balancing

At this point ProMAX's interactive velocity tools was used to pick suitable velocities for the profile at every 100th CDP. Picks were based upon semblance plots that were generated automatically by the system. Once the velocities had been picked, the main processing

sequence continued by applying the spatial movement sub-processes as follows:

d. Normal moveout corrections
e. Trace muting
f. Common depth point stacking
g. Phase shift migration
h. Dip filtering

Finally, the data were prepared for display on the OYO plotter by application of a time variant filter and automatic gain. As with the shallow penetration data, several trial plots were undertaken on an example line for review by DMG and USGS personnel. Once the final parameters had been chosen, all processed lines were plotted. Selected lines were then re-plotted at different scales appropriate for annotation for the final report.

3.4 ACOUSTIC CORE LOGS

Processing of the acoustic core log data was accomplished by use of Caulfield Engineering's proprietary software. Full details of the processing sequence are not available for public release, but the following overview describes the processing sequence in general terms. Acoustic core logging requires that the absolute amplitude and other properties of the reflected sound waves be determined in relation to the transmitted sound wave. In order to calculate these properties, the results of the tests on the transmitting and recording systems were applied to the data collected over the survey lines. The returns were then plotted on a color plotter to provide absolute amplitude plots of the reflection data.

The color plots were examined by Pelagos, DMG and USGS personnel to determine where it would be appropriate to calculate acoustic core logs. The logs were then calculated by the Caulfield Engineering software package. The final step was to compare the acoustic core logs to the actual cores (collected by CALTRANS and analyzed by Dr. G. Kennedy) to match the data sets. Final plots and tables were then produced of the acoustic profiles and core logs.

3.5 PLOTTING AND CHARTING

Once the charts and sections resulting from the processing efforts had been interpreted by DMG and USGS personnel, the resulting interpreted copies of the sections and charts were returned to Pelagos for additional drafting and plotting to produce the final charts and sections. Charting of the resulting geological information was undertaken using AutoCAD and after several reviews final track charts and geological features charts were produced. Copies of the sections produced at scales specifically for the final report were returned to Pelagos by DMG for final drafting of the geologists' interpretation. These were applied to the translucent originals by Pelagos' drafting department to produce final sections, which were reproduced for the final report.